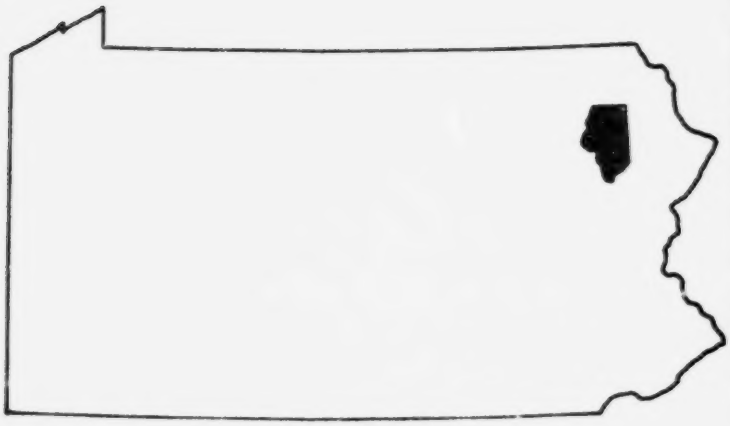
JUN 13 1990

FLOOD INSURANCE STUDY

TOWNSHIP OF NEWTON, PENNSYLVANIA
LACKAWANNA COUNTY



JULY 3, 1990

Federal Emergency Management Agency

COMMUNITY NUMBER 421756

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision (LOMR) process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Flood Insurance Study Effective Date: July 3, 19[illegible]

Flood Insurance Study Revised:

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
	1.1 Purpose of Study	1
	1.2 Authority and Acknowledgments	1
	1.3 Coordination	1
2.0	AREA STUDIED	2
	2.1 Scope of Study	2
	2.2 Community Description	2
	2.3 Principal Flood Problems	2
	2.4 Flood Protection Measures	2
3.0	ENGINEERING METHODS	2
	3.1 Hydrologic Analyses	4
	3.2 Hydraulic Analyses	5
4.0	FLOODPLAIN MANAGEMENT APPLICATIONS	6
	4.1 Floodplain Boundaries	6
	4.2 Floodways	6
5.0	INSURANCE APPLICATIONS	9
6.0	FLOOD INSURANCE RATE MAP	10
7.0	OTHER STUDIES	10
8.0	LOCATION OF DATA	11
9.0	BIBLIOGRAPHY AND REFERENCES	11

TABLE OF CONTENTS - continued

Page

FIGURES

Figure 1 - Vicinity Map 3

Figure 2 - Floodway Schematic 7

TABLES

Table 1 - Summary of Discharges 4

Table 2 - Floodway Data 8

EXHIBITS

Exhibit 1 - Flood Profiles
Susquehanna River Panel 01P
Falls Creek Panel 02P

Exhibit 2 - Flood Insurance Rate Map and Street Index

Exhibit 3 - Elevation Reference Marks

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Township of Newton, Lackawanna County, Pennsylvania, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by the U. S. Geological Survey (USGS) for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-85-E-1823, Project Order No. 21. This work was completed in August 1987.

1.3 Coordination

On April 15, 1985, an initial Consultation and Coordination Officer's (CCO) meeting was held with representatives from FEMA, the Lackawanna County Planning Commission, and the USGS (the study contractor) to determine the streams to be studied by detailed methods.

On June 26, 1989, a final CCO meeting was held with representatives from FEMA, the township, and the study contractor to review the results of the study.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Township of Newton, Lackawanna County, Pennsylvania. The area of study is shown on the Vicinity Map (Figure 1).

The following streams were studied by detailed methods: the Susquehanna River, for its entire length within the community; and Falls Creek, from a point approximately 1.4 miles upstream of the downstream corporate limits to a point approximately 0.8 mile upstream. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction through August 1992.

The following flooding sources were studied by approximate methods: Buttermilk Creek, Gardner Creek, Fords Lake, several unnamed tributaries, and the remaining portions of Falls Creek. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon by, FEMA and the Township of Newton.

2.2 Community Description

The Township of Newton is located in the western portion of Lackawanna County in eastern Pennsylvania, approximately 8 miles northwest of Scranton. It is bordered by the Township of Exeter, Luzerne County, and the Township of Exeter, Wyoming County, to the west; the Township of Falls, Wyoming County to the northwest; the Townships of West Abington and Glenburn to the north; the Township of South Abington to the northeast; and the Township of Ransom to the south.

2.3 Principal Flood Problems

Major floods cause localized inundation of structures along Falls Creek.

2.4 Flood Protection Measures

No flood-control structures have been built to alleviate flooding on small streams in the community.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. A flood event of a magnitude which

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF NEWTON, PA
(LACKAWANNA CO.)

APPROXIMATE SCALE

0 2 4 8 MILES

VICINITY MAP

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3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence interval.

Cross sections were field surveyed and located at close intervals above and below bridges and culverts in order to compute the significant backwater effects of these structures. All bridges and culverts in the community were field surveyed to obtain elevation data and structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1) and the Flood Insurance Rate Map (Exhibit 2) where applicable.

Water-surface elevations of floods of the selected recurrence intervals for the Susquehanna River were taken from the Flood Insurance Study for the Township of Exeter, Luzerne County (Reference 3). In that study, water-surface elevations were computed using the U. S. Army Corps of Engineers (COE) HEC-2 step-backwater computer program (Reference 6). For Falls Creek, from a point approximately 75 feet downstream of a private bridge to a point approximately 34 feet upstream of L. R. 35017 bridge, water-surface elevations were computed by modeling channel and bridge hydraulics with the USGS WSPRO step-backwater computer program (References 7 and 8). The starting water-surface elevation was determined by a normal-depth computation. For Falls Creek, from a point approximately 1.9 miles upstream of the corporate limits to a point approximately 0.3 mile upstream, normal depths of flooding for the 100-year recurrence interval were estimated from the regional relationship between drainage area and flood depth prepared by the USGS (Reference 9). This relationship was developed through regional regression analyses of basin areas and 100-year within-channel depths observed at stream gages. Flood profiles were drawn showing computed water-surface profiles for floods of the selected recurrence interval.

Channel roughness factors (Manning's "n") used in the hydraulic computations were assigned on the basis of engineering judgment and field inspection of the channel and floodplain areas. For the Susquehanna River, channel "n" values ranged from 0.026 to 0.057, and overbank "n" values ranged from 0.056 to 0.160. For Falls Creek, channel "n" values ranged from 0.035 to 0.041, and overbank "n" values ranged from 0.032 to 0.070.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). Elevation reference marks used in this study are shown on the maps; the descriptions of the marks are presented in Elevation Reference Marks (Exhibit 3).

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100-year floodplain boundaries to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. For the streams studied in detail, the 100-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000 with a contour interval of 20 feet (Reference 10).

For the flooding sources studied by approximate methods, the 100-year floodplain boundaries were delineated using the Flood Hazard Boundary Map for the Township of Newton (Reference 11).

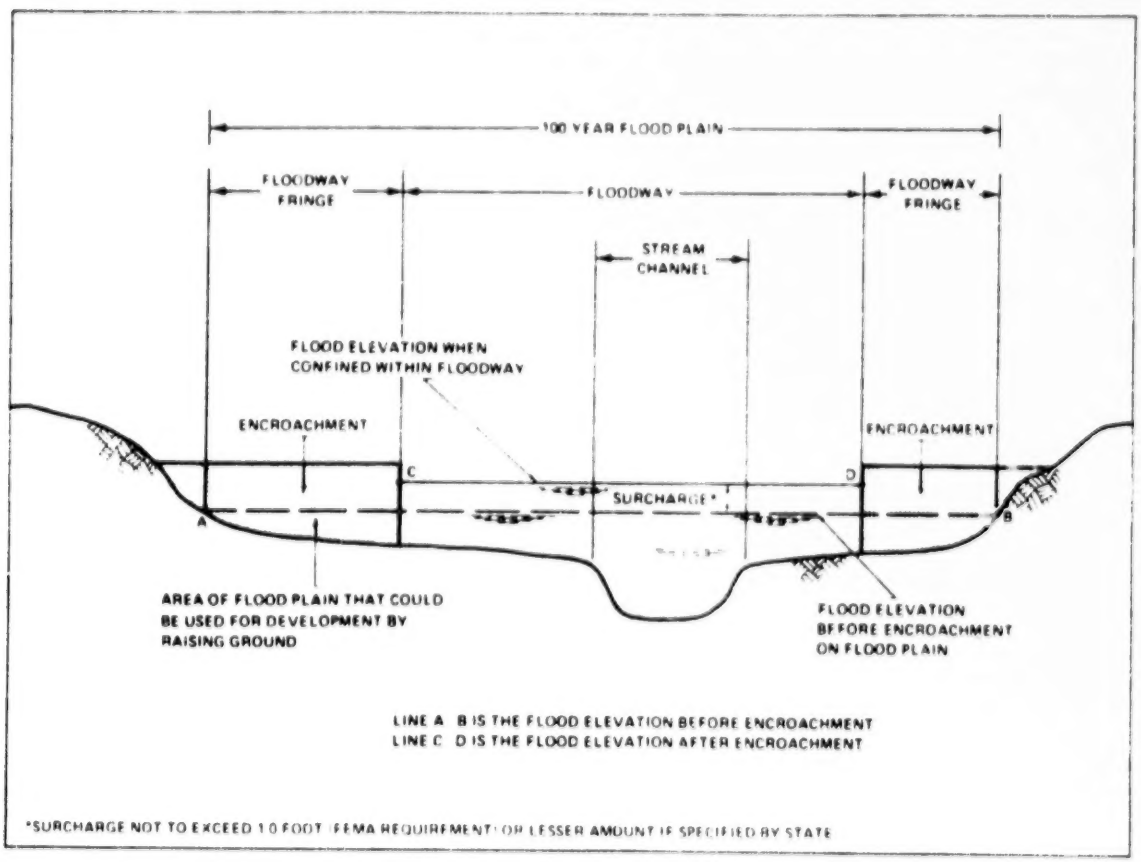
The 100-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 2). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE). Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 100-year floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodway in this study is presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodway presented in this study was computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (Table 2). The computed floodway is shown on the Flood Insurance Rate Map (Exhibit 2). In cases where the floodway and 100-year floodplain boundaries are either close together or collinear, only the floodway boundary is shown. Portions of the floodway widths for the Susquehanna River extend beyond the corporate limits. The floodway information presented in this study for the Susquehanna River was taken from the Flood Insurance Study for the Township of Exeter, Luzerne County (Reference 3). Because of the scope of this study, no floodway was calculated for Falls Creek.

The area between the floodway and 100-year floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 2.


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE

FLOODWAY SCHEMATIC Figure 2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
					(FEET NGVD)			
Susquehanna River								
A	440	871	27,170	9.1	572.4	572.4	572.9	0.5
B	1,640	961	30,409	8.2	573.2	573.2	573.7	0.5
C	2,440	1,175	36,715	6.8	573.9	573.9	574.4	0.5
D	4,700	1,582	40,723	6.1	574.6	574.6	575.0	0.4
E	6,030	1,281	35,988	6.9	574.9	574.9	575.3	0.4

[1]Feet above corporate limits
[2]Width extends beyond corporate limits

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF NEWTON, PA
(LACKAWANNA CO.)

FLOODWAY DATA

SUSQUEHANNA RIVER

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. The zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100-year floodplain. The locations of selected cross sections used in the hydraulic analyses are shown where applicable.

7.0 OTHER STUDIES

Flood Insurance Studies have been prepared for the Township of Exeter, Wyoming County, the Township of Exeter, Luzerne County, and the Townships of Ransom and Falls (References 2, 3, 12, and 13). The results of this study are in complete agreement with the results of those studies.

A Flood Insurance Study has been prepared for the Township of South Abington (Reference 14). Because of the differing methods used to delineate approximate floodplain boundaries, the results of this study are not in complete agreement with the results of that study.

A Flood Insurance Study is currently being prepared for the Township of Glenburn (Reference 15). The results of that study will be in complete agreement with the results of this study.

Because it is based upon more detailed analyses, this study supersedes the Flood Hazard Boundary Map for the Township of Newton (Reference 11).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, Liberty Square Building (Second Floor), 105 South Seventh Street, Philadelphia, Pennsylvania 19106.

9.0 BIBLIOGRAPHY AND REFERENCES

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3. Federal Emergency Management Agency, Flood Insurance Study, Township of Exeter, Luzerne County, Pennsylvania, Washington, D. C., October 20, 1983.

4. U. S. Department of the Interior, Geological Survey, Water-Resources Investigations 82-21, Evaluation of the Streamflow-Data Program in Pennsylvania by H. N. Flippo, Jr., Harrisburg, Pennsylvania, 1982.

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10. U. S. Department of the Interior, Geological Survey, 7.5-Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 20 Feet: Ransom, Pennsylvania, 1946, Photorevised 1976; Scranton, Pennsylvania, 1947, Photorevised 1976.

11. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Township of Newton, Lackawanna County, Pennsylvania, October 29, 1976.

12. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Township of Ransom, Lackawanna County, Pennsylvania, Washington, D. C., April 15, 1980.

13. Federal Emergency Management Agency, Flood Insurance Study, Township of Falls, Wyoming County, Pennsylvania, Washington, D. C., July 3, 1990.

14. Federal Emergency Management Agency, Flood Insurance Study, Township of South Abington, Lackawanna County, Pennsylvania, Washington, D. C., December 15, 1982.

15. Federal Emergency Management Agency, Flood Insurance Study, Township of Glenburn, Lackawanna County, Pennsylvania (Unpublished).

EXHIBIT 3 - ELEVATION REFERENCE MARKS

Reference Mark	Elevation (Feet NGVD)	Description of Location
RM 1	1,069.62	Chiseled square on top of northeast wing wall on downstream side of L. R. 35017 bridge over Falls Creek.
RM 2	588.00	Existing pavement surface at centerline of State Route 92 (Sullivan Trail) over Dymond Creek.

CORPORATE LIMITS

CORPORATE LIMITS

LIMIT OF FLOODING AFFECTING COMMUNITY

ELEVATION IN FEET (NGVD)

580
570
560
550
540
530

A B C D E

0 1 2 3 4 5 6 7 8

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CORPORATE LIMITS

100 YEAR FLOOD

STREAM BED

CROSS SECTION LOCATION

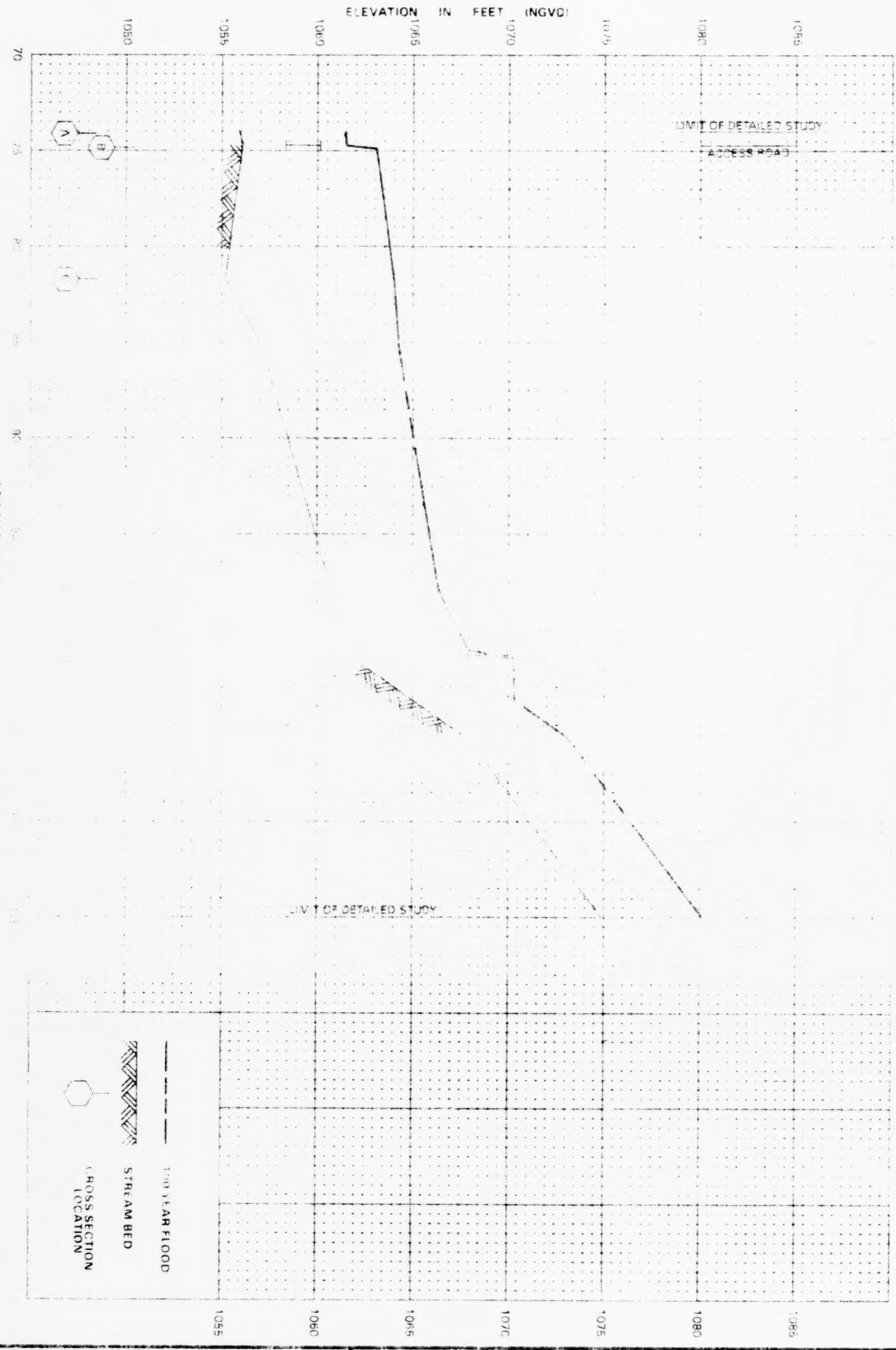
FLOOD PROFILES

SUSQUEHANNA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF NEWTON, PA
(LACKAWANNA CO.)

01P



02P

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWNSHIP OF NEWTON, PA
(LACKAWANNA CO.)

FLOOD PROFILES

FALLS CREEK